CHAPTER 1

Introduction

This manual is designed to provide guidance on how to assess pollution prevention (P2) opportunities at pesticide formulating, packaging, and repackaging (PFPR) facilities and to assess compliance with the P2 Alternative Option of the effluent limitations guidelines and standards for the PFPR industry (61 FR 57517). The opportunities and compliance methodologies discussed in this manual specifically relate to water use and reuse, wastewater generation, and wastewater treatment and disposal. The manual is intended for use by PFPR facility managers, publicly owned treatment works (POTWs), permit writers and other regulatory agency representatives, federal and state auditors, and consultants.

Why Implement P2?

Effective P2 programs offer several benefits, summarized in Table 1-1, when incorporated as part of facility operations. Although this manual concentrates on water management practices, a P2 assessment and the resulting operation changes often lead to overall improvements in the efficiency of PFPR process operations through decreasing the loss of raw materials and minimizing waste disposal costs.

Table 1-1
Examples of Benefits of Pollution Prevention

Cost Benefits of Pollution Prevention

- Cost savings from recovery of active ingredients
- Cost savings from recovery of water
- Reduction in cost of waste disposal
- Reduction in permitting costs

Other Advantages of Pollution Prevention

- Improved corporate image
- Improved worker and community safety
- Compliance with effluent guidelines
- Assistance with environmental programs

Information contained in the manual is not meant to represent an exhaustive list of P2 opportunities that may exist or should be put to use at any one facility; rather, it is intended to identify P2 practices currently in use in the industry and to provide additional information on how to implement these and other practices as well as aid in compliance with the PFPR effluent guidelines and standards. The Environmental Protection Agency's (EPA's) Office of Research and Development previously published P2 guides for the pesticide formulating industry and for nonagricultural pesticide users. These guides evaluated waste minimization options for formulating facilities, and were not specifically focused on water management practices.

In addition, many states have developed P2 guidance applicable to PFPR facilities. Members of the PFPR industry and their trade associations have also spent time and money evaluating the incorporation of P2 into facility operations and have developed effective tools to assist that process.

What is P2?

The Pollution Prevention Act of 1990 established a national policy to prevent or reduce pollution at the source whenever feasible as the first and preferred choice for environmental management. This policy is referred to as pollution prevention, or source reduction, and may include in-process recycling practices. Table 1-2 shows EPA's preferred hierarchy of environmental management options, of which pollution prevention is the first choice. Table 1-2 also presents a definition of source reduction/pollution prevention as it pertains to the environmental hierarchy.

Table 1-2
Environmental Management Hierarchy

1. Pollution should be prevented or reduced at the source whenever feasible ("source reduction");
2. Pollution that cannot be prevented should be recycled in an environmentally safe manner whenever feasible;
3. Pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible; and
4. Disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner.

Source Reduction

- Any practice that reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment prior to recycling, treatment, or disposal;
- Any practice that reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants; and
- Equipment or technology modifications, process or procedure modifications, reformulation or redesign of products, substitution of raw materials, and improvements in housekeeping, maintenance, training, or inventory control.

EPA is required by the Pollution Prevention Act of 1990 to incorporate P2 into all of EPA's activities, including rulemaking and implementation. The Source Reduction Review Project was established in 1992 to instill the tenets of the Pollution Prevention Act into every phase of EPA's rulemaking process. As a part of this effort, EPA has focused on incorporating P2 practices, specifically the reuse and recycle of process wastewaters, into effluent limitations guidelines and standards for the PFPR industry.

PFPR Pollution Prevention Alternative

On September 30, 1996, EPA promulgated effluent limitations guidelines and standards for the PFPR industry. A copy of the final rule is contained in Appendix A. The final rule covers process wastewater discharges from PFPR operations occurring at facilities in two subcategories, as defined in Table 1-3. The formulation, packaging, and/or repackaging of all pesticide products fall within the rule's applicability, with the exception of the six groups of products listed in Table 1-4. (The regulatory definitions of these excluded pesticide products can be found starting on page 57548 of the final rule FR notice, in Appendix A of this manual.)

Table 1-3
PFPR Industry Definitions

Subcategories

Subcategory C:	Pesticide formulating, packaging, and repackaging (PFPR), including PFPR operations at pesticide manufacturing facilities and at stand-alone PFPR facilities (Note: does not include research and development operations).
Subcategory E:	Repackaging of agricultural pesticide products at refilling establishments (Note: does not include custom application).

PFPR Operations

Formulating:	The process of mixing, blending, or diluting one or more pesticide active ingredients with one or more active ingredients, without an intended chemical reaction, to obtain a manufacturing use product or end use product.
Packaging:	The process of enclosing or placing formulated pesticide product into a marketable container.
Repackaging:	The direct transference of a pesticide active ingredient or formulated product from any marketable container into another marketable container, without a change in composition of the formulation or the labeling content, for sale or distribution.

A flow chart depicting the process to determine whether a facility is subject to the PFPR effluent guidelines or pretreatment standards is shown in Figure 1-1. The first step is to determine if the facility formulates, packages, and/or repackages pesticide products based on the industry definitions presented in Table 1-3. If the answer is no, the facility is not subject to this rule. If the answer to any of these questions is yes, the next step is to determine whether the pesticide products contain active ingredients that are within the scope of the rule based on the exemptions listed in Table 1-4. If they do, the facility must operate in compliance with the PFPR effluent guidelines.

Table 1-4
Excluded Pesticide Products

- Sanitizer products;
- Microorganisms;
- Group 1 and Group 2 mixtures;
- Inorganic wastewater treatment chemicals;
- Chemicals that do not pass through POTWs; and
- Certain liquid chemical sterilants.

The final rule requires facilities to meet zero discharge of process wastewater pollutants. The rule also offers the option of a Pollution Prevention Alternative to Subcategory C facilities that agree to implement certain P2, reuse, and recycle practices (and treatment when necessary). These facilities receive a discharge allowance referred to as the P2 allowable discharge (see Appendix A for the definition of allowable discharge). As shown in Figure 1-1, if the facility does not generate any wastewater from their PFPR operations, they are not covered by the rule (no potential to discharge). If they generate a pesticide-containing wastewater, a determination must be made of whether the wastewater is covered under the final rule; the rule does exempt from regulation certain wastewater sources, which are discussed in Chapter 4.

If it is determined that the facility generates a wastewater covered under the rule and does not discharge this wastewater, but has the potential to discharge, they are covered and are in compliance with zero discharge. If they wish to discharge that wastewater, they must comply with the P2 alternative.

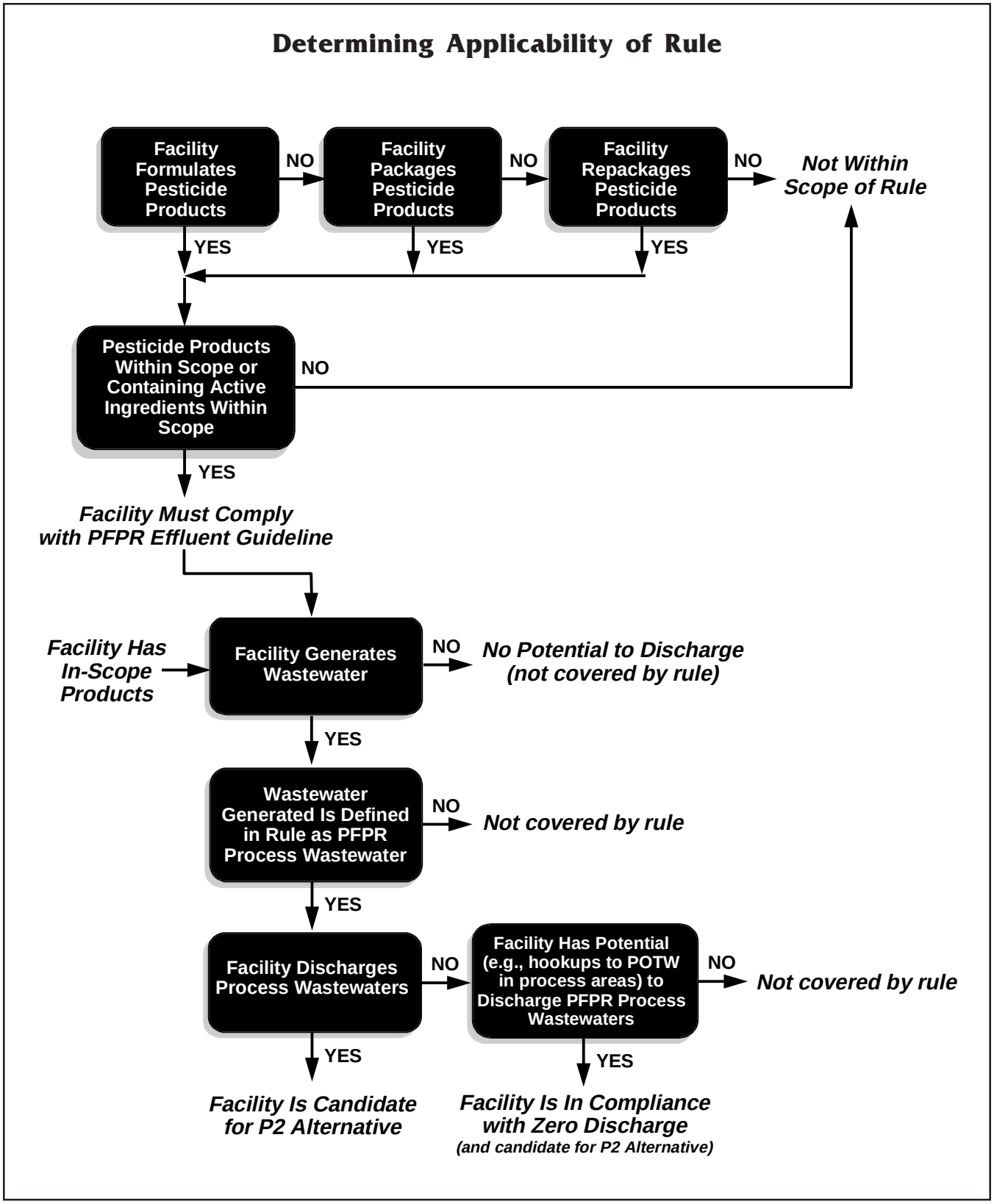

Figure 1-1. Determining Applicability of Rule

Each facility subject to the final PFPR rule will need to make an initial choice of how to comply with the regulation. They will need to choose to either comply with the zero discharge effluent limitation/pretreatment standard or agree to conduct the P2 practices listed in Table 8 of the rule (and conduct treatment where necessary). The facility can also use a variation of a listed practice based on modifications listed in Table 8 of the final rule or those agreed to by the permitting/control authority. Facilities will also need to agree to make the practices and the P2 discharge allowance enforceable; for example, the facility would agree to include them in their NPDES permit for direct discharges or in an individual control mechanism with the control authority for indirect discharges. This choice can be made either on a facility-wide basis or on a process basis (i.e., product family/process line/process unit). Each of the P2 practices listed in Table 8 of the rule is described more fully in Chapter 3 of this manual.

EPA's Office of Water and Office of Pollution Prevention and Toxics have created this guidance manual to facilitate compliance with this rule. P2 practices that are required as part of compliance with the P2 alternative form the basis of the manual; however, other nonrequired P2 opportunities that a facility may choose to implement are also presented. Because the manual focuses on water use and wastewater generation, it is not intended to offer guidance on the development of state P2 plans; however, P2 opportunities discussed here may also be incorporated into PFPR facility state P2 plans. The manual does not include an exhaustive list of all possible P2 opportunities, but provides a framework for an initial assessment of PFPR operations as they pertain to water use and wastewater generation and to compliance with the P2 alternative.

How to Use This Manual

This manual is organized into 10 chapters and six appendices:

- **Chapter 2** provides basic descriptions of PFPR operations (e.g., dry formulating, aerosol packaging, and drum rinsing) for those readers unfamiliar with this industry;
- **Chapter 3** provides a glossary of the specific P2 practices and equipment required to implement the P2 alternative, as well as other P2 practices and equipment found in the industry, including illustrations and benefits of use;
- **Chapter 4** presents instructions and an example for conducting P2 audits to evaluate water management practices at PFPR facilities and to aid in making compliance decisions;
- **Chapter 5** discusses wastewater treatment technologies;
- **Chapter 6** presents information on how to conduct a treatability test;
- **Chapter 7** discusses evaluation of wastewater treatment system performance, compliance with the PFPR effluent guidelines rule, and certification paperwork;
- **Chapter 8** presents case studies to provide guidance to the user in complying with the PFPR regulation;

- **Chapter 9** provides a list of resources for additional help in complying with the regulation;
- **Chapter 10** presents questions asked at the five workshops EPA conducted on the PFPR rule in July through September 1997 and EPA's responses to those questions, which are grouped by topic;
- **Appendix A** presents the final rule for the PFPR industry;
- **Appendix B** presents tables that can be used to document the results of P2 audits, wastewater treatment tests, and compliance decisions related to the final PFPR rule;
- **Appendix C** lists the pesticide active ingredients presented in Table 10 to Part 455 (in Appendix A) together with their Shaughnessy codes and CAS numbers;
- **Appendix D** provides an excerpt on test procedures for an EPA-sponsored treatability test.
- **Appendix E** presents guidance on requirements of the Baseline Monitoring Report (BMR) and the applicability of categorical pretreatment standards to industrial users, including zero discharge facilities; and
- **Appendix F** presents a list of terms, and their definitions, commonly used in the PFPR industry (regulatory definitions are included in the final rule).

This is the first time that EPA has written a P2 Guidance Manual in conjunction with a rule, and we would like your valuable input on how useful this document is to you. On page 159, you will find a short survey requesting your input. Please take a moment to evaluate the manual's usefulness in describing P2 opportunities for the PFPR industry and evaluating compliance with the PFPR effluent guidelines rule, and whether you thought the manual was "user friendly."